ANNUAL INTERNAL WASTE STREAM DISCHARGE REPORT AND CERTIFICATION FOR BUILDING 374 FOR CALENDAR YEAR 2004

U. S. Department of Energy
Kaiser-Hill Company, L.L.C.
Rocky Flats Closure Sites Services, L.L.C.

April 1, 2005

ANNUAL INTERNAL WASTE STREAM DISCHARGE REPORT AND CERTIFICATION FOR BUILDING 374 FOR CALENDAR YEAR 2004

I. INTRODUCTION

The Rocky Flats Environmental Technology Site's (RFETS or the Site) National Pollutant Discharge Elimination System (NPDES) permit requires an annual report of waste streams sent for treatment at the Process Waste Treatment Facility, B374, and the Wastewater Treatment Plant, B995. Part III Section I of the permit requires:

> In addition, the permittees shall submit an annual report to both EPA and the State of Colorado summarizing the status of non-sanitary wastewaters going to the sewage treatment plant and to Building 374 during the calendar year. The wastewaters shall be listed separately for the sewage treatment plant and for Building 374. The report shall list the building from which the wastewater originates; briefly describe the nature of the wastewater; provide a listing of the pollutants of concern; briefly describe any pretreatment of the wastewater; and give the approximate annual volume of the wastewater, in gallons. This would include routine internal waste streams such as blowdown water from cooling towers in which chemical additives other than chlorine, inorganic acids, and inorganic bases (e.g., sulfuric acid, sodium hydroxide, etc.) are used. The annual report shall be in the form of a letter with attachments and shall be submitted by no later than April 1 of the following year. This reporting shall include an estimate of infiltration and inflow rates in the collection system, and an evaluation of the possible detrimental effect of this dilution on the treatment system performance.

In addition to the reporting of internal discharges to the treatment facilities, the permit also has a specific annual requirement for B374. Part I of the permit requires:

> The permittee shall submit an annual report to both EPA and the State of Colorado Department of Public Health and Environment summarizing the results of analyses of such monitoring during the calendar year, including the following calculation regarding conductivity of the discharge:
>
> i. the maximum conductivity observed during each month;
> ii. the time-weighed [sic]average conductivity during each month;
> iii. the number of times the conductivity exceeded 150 umhos/cm at 25°C for a duration of more than 5 minutes during each month;
> iv. if the conductivity exceeded 150 umhos/cm at 25°C for a duration of more than 5 minutes; give the longest period of time during each month; and,
> v. the total length of time the conductivity exceeded 150 umhos/cm at 25°C during each month.
>
> In addition, the annual report shall include an annual certification that the evaporator effluent has met the quality requirements for the "commercial product" Resource Conservation Recovery Act (RCRA) exclusion described in 40 CFR Section 261.2(e)(1)(ii) during the previous calendar year. The annual report shall be in the form of a letter with attachments and shall be submitted by no later than April 1 of the

following year.

II. REPORT CONTENTS

This report has three sections: 1) The Building 374 Annual Discharge Certification and Influent Waste Streams Report, 2) a list of routine internal waste streams accepted at B995, and 3) an evaluation of infiltration and inflow into the sanitary collection system and potential impacts on the unit processes at B995.

Each section contains a separate certification statement, based on the specific permit requirements, as described in the introduction. The certification for section 1 includes the routine certification statement required by Part IV Section G.4. of the NPDES permit, as well as a statement that all operations at Building 374 that fell within the scope of the NPDES requirements have ceased and that Outfall 014 is no longer in use. The 2003 Annual Report contained this certification. It is provided again with the 2004 report because there has been no change in the status of the outfall. Building 374 has been demolished and no longer exists. Sections 2 and 3 contain the routine certification set forth in the permit.

The report also describes the abandonment of the wastewater treatment plant and its demolition. As a result, this is the final annual report for the RFETS NPDES outfalls STP1 and 014.

III. SUMMARY

This report reconfirms that B374 has ceased discharging, lists the waste streams accepted for treatment at Building 995, and provides a final evaluation of the impacts of infiltration and inflow at B995. That evaluation presents flow and precipitation information for 2004. As reported in previous years, it is apparent that infiltration and inflow did not adversely impair biological treatment in the unit processes. Building 995 was demolished in 2004 after a half century of operation.

SECTION 1

BUILDING 374 ANNUAL DISCHARGE CERTIFICATION AND INFLUENT WASTE STREAMS

CERTIFICATION STATEMENT FOR THE BUILDING 374 ANNUAL DISCHARGE CERTIFICATION AND INFLUENT WASTE STREAMS

I certify under penalty of law that this document was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

I further certify that in Calendar Year 2003 that there was no discharge of evaporator effluent from Building 374 and that Outfall 014 has been abandoned.

AT Chatfield for Tom Dieter — 3-18-04

Tom Dieter
Vice President and Project Manager
371/374 Project
Kaiser Hill Company, L.L.C.

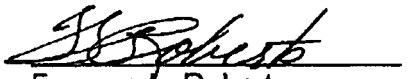
Date

SECTION 2

BUILDING 995 INTERNAL WASTE STREAMS

CERTIFICATION STATEMENT FOR THE BUILDING 995 INTERNAL WASTESTREAMS

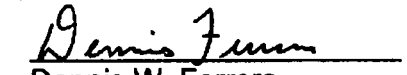
We certify under penalty of law that this document and all attachments were prepared under our direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on our inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of our knowledge and belief, true, accurate, and complete. We are aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



3-10-05

Frances L. Roberts
General Manager
Rocky Flats Closure Site Services, L.L.C.

Date



3/15/05

Dennis W. Ferrera
Vice President and Project Manager
Remediation, Industrial D&D and Site Services Project
Kaiser-Hill Company, L.L.C.

Date

Annual Routine Internal Waste Streams Report

Active Routine IWS Discharges to RFETS WWTP

Report for dates from: 1/ 1/04 *to:* 8/ 9/04

Building Number	Waste Stream Description	Discharge Volume (Gal/yr)
122	Water used in X-ray development	250
122	Developer systems cleaner "Cronex"	60
122	Developer "Cronex"	375
124	Foundation Drain	365000
124	Process water samples tested for pH, chlorine & turbidity	2000
124	D-1 Pit water with low level diesel contamination	12600
231B	Rain/snow water in berm previously went to 995 will be treated in 891.Ne	50000
331	Wash water and detergents, fuels, fluids, oils, grease	1000
331FD	Hose wash water	10000
331FD	Floor wash water	10000
331FD	Truck wash water	10000
331G	Water from open trench type floor drain in garage area. Water consists o	15600
371	E910 Heat Exchangers Quarterly Emergency Generator Load Test (now	48000
371	Condensate Return System 1, 2, and 3 for Building 371. 35,000/year	35000
371	Solution of water and sodium BiCarbonate used for cleaning breathing air	12
440	Steam heating system-condensate water	600
447	Water is coming from ground water seeping into the 447 elevator pit. The	2800
559	Air compressor condensate with neg amt synthetic oil	100
559	Condensation and drain water from multi-zone supply zone	12000
559	Groundwater collecting in manhole between 559/561. Currently pumps to	12000
566	Respirator washer waste water with detergents & bleach	15200
664	Rinsing water from 'Zamboni' tank	2000
664	Steam heating system-condensate water	12000
707	B707 HVAC condensate water	35000
708	Air compressor condensate with trace amount coolant.	750
708	Cooling water leakage & NALCO, corrison inhibitor	10
711	Cooling tower blowdown	182500
776	Condensate from cooling system	80000
881	Water from showers. Workers doff PPE at containments, monitor out an	6000
991	Suppy fan #3; Cooling Tower Supply Fan for Air Conditioning system.	1000
991	Water from air compressor	50

Active Routine IWS Discharges to RFETS WWTP

Report for dates from: 1/ 1/04 *to:* 8/ 9/04

Building Number	Waste Stream Description	Discharge Volume (Gal/yr)
na	Hand wash stations across plantsite-wastewater	4800
T130C	Re-circulation water from the X-ray machine.	560
T130G	Previously described as WSRIC ID#850-3-4 (building move.)	1
T130G	Previously described as WSRIC ID#850-3-3 (building move.)	20
T130G	Photo lab 'Process Water' in room 68. Previously WSRIC 850-2-3 (buildi	16
T130G	'Photochemicals'. Previously identified as WSRIC 850-2-1 (building mov	65
T130K	Water comes from cleaning respirators from various projects. No rad con	1920
T130M	Water is from cleaning respirators from various projects. Respirators are	640
T865G	Water from laundering of modesty clothing for 865. Estimated volume is	20000
	Annual Routine IWS Discharge Volume to RFETS WWTP	**949,929**

SECTION 3

EVALUATION OF INFILTRATION AND INFLOW

EVALUATION OF INFILTRATION AND INFLOW AT THE ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE WASTEWATER TREATMENT PLANT FOR CALENDAR YEAR 2004

1 INTRODUCTION

The Rocky Flats Environmental Technology Site (RFETS or the Site) was served by a small activated sludge wastewater treatment plant (WWTP) and a sanitary collection system with over 40,000 feet of pipe. The plant operations and discharges were regulated by a National Pollutant Discharge Elimination System (NPDES) permit issued by the Environmental Protection Agency (EPA) and certified by the State of Colorado. Among the permit requirements is an annual report of impacts of infiltration and inflow (I&I) on the WWTP, also known as Building 995 (B995). The first of these reports (DOE, March 2002) covered calendar year 2001 (CY01); the second report covered calendar year 2002 (CY02) (DOE, April 2003); the third report (DOE 2004), covered calendar year 2003 (CY03); and this, the fourth and final report, covers calendar year 2004 (CY04).

The approach for the 2004 report is similar to that for the previous years, comparing flow and precipitation records. Following the introduction of regional information in last year's report, the climatological records for Denver are again included for comparison, and a year-to-year comparison is made with the previous years' records. The year 2004, like 2003, offers a chance to see the impacts of more normal precipitation compared with the severe drought of 2002, what has been reported as a 300-year drought. Based on Site records, 38% less precipitation fell in CY02 compared to CY01 (7.94 in. in 2002 vs 12.74 in. in 2001). In CY03, there was a 36% increase in recorded precipitation at the Site over CY02 (10.8 in. in 2003 vs. 7.94 in 2002), and in CY04, there was an increase of 113% over CY02, and 56% over CY03.

In calendar year 2004, the RFETS WWTP performed well, treating approximately 22 million gallons of effluent which met all applicable permit requirements. CY04 shows a significant decrease in the volume of discharge, down 45% from CY03. For the past 4 years, the total annual discharge has been 54, 49 39 and 22 MGY. The dramatic reduction in CY04 is due to the continuing closure activities at the Site and the ongoing reduction in the work force.

2 BACKGROUND

The Site's sanitary collection system flowed down gradient from west to east across the industrial area. Two sub-basins of the collection system joined at Building 990 (B990) where the original equalization basins were located. The north sub-basin served that portion of the plant formerly located within the Protected Area (PA). The south sub-basin collected sanitary flow from the rest of the plant exterior to the former PA. The PA was completely eliminated in 2003 with the removal of the final barriers surrounding Building

371/374. From B990, wastewater flowed into one of three 110,000 gallon influent storage tanks at B995. While one tank was filling, another tank holding the previous day's flow was being processed. Operators were present during daylight hours only so the plant was normally processing influent collected during the previous day/night cycle. The influent tanks provided flow equalization to a greater extent than the older and smaller 60,000 gallon tanks at B990.

Collection system flow was monitored at B990 just before the north and south side flows combine. Sonic transducers measured water levels behind plywood barriers which served as rudimentary sharp crested weirs. The electronic measurements made by the transducers were sent to the control room at the wastewater plant, where daily total flow volumes were estimated and recorded. B990 flow data were not used for operational purposes. Because the transducers were not included in the Site's routine calibration procedure, and the totalizer data collected for general information purposes only, the inclusion of these data was eliminated from this final report.

NPDES-required flow monitoring was conducted at the wastewater treatment plant. Daily effluent flows were measured with a routinely calibrated V-notch weir located immediately downstream of the ultraviolet disinfection step. This location was designated as Outfall STP1 in the current permit. For purposes of the I&I evaluation, daily flows as reported from STP1 were compared to the Site's record of precipitation events.

3 METHODS

In previous reports, the video examination of portions of the sanitary collection system was described. Based on the overall good repair of the transmission lines observed in that effort, no additional video assessments have been made. The methods used to collect data for the CY04 assessment are the same as reported in the previous reports, flow measurement at B995, and comparison with recorded precipitation at RFETS. CY02 was noteworthy as a year of severe drought. Paleodendrochronology records compiled and evaluated by the City of Boulder demonstrated that the last time this region had so little rainfall was 1723 (City of Boulder, 2002). In contrast, CY03 was more normal in the amount of precipitation, although the Site records show that there was less precipitation in CY03 than in CY01, and CY04 is shown to be the wettest year of all in this study. For this report, regional climatological records were again collected primarily to compare the Site's precipitation record to that of Denver.

4 RESULTS

4.1 Observations In The Collection System

Because previous investigations using video equipment to examine the collections system indicated that the system is in generally good repair, no further examinations were

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scheduled. Manholes and other potential points of entry for storm water inflow were maintained in good order to minimize the entry of runoff.

Within the general area of the RFETS plant site, precipitation was measured and recorded at RFETS monitoring stations. Figure 1 shows the average monthly precipitation, in inches, in CY04 compared to the same measurements in previous years. This figure clearly shows the effects of the CY02 drought, although regional records suggest that Colorado has been in the grips of a long term drought for at least the past three years (Boulder 2002). The data for CY04 suggest a more normal pattern of precipitation, although as Figure 1 shows, with a spring peak arriving in the same month month as the CY03 blizzard, and a second peak in June.

Figure 2 shows the cumulative precipitation for each of the past 4 years. These patterns show that CY04 was similar to the more normal pattern exhibited by CY01, and emphasizes the abnormal conditions in CY02. This figure also shows total precipitation for each year.

Figure 1 Comparison of Monthly Precipitation on Site

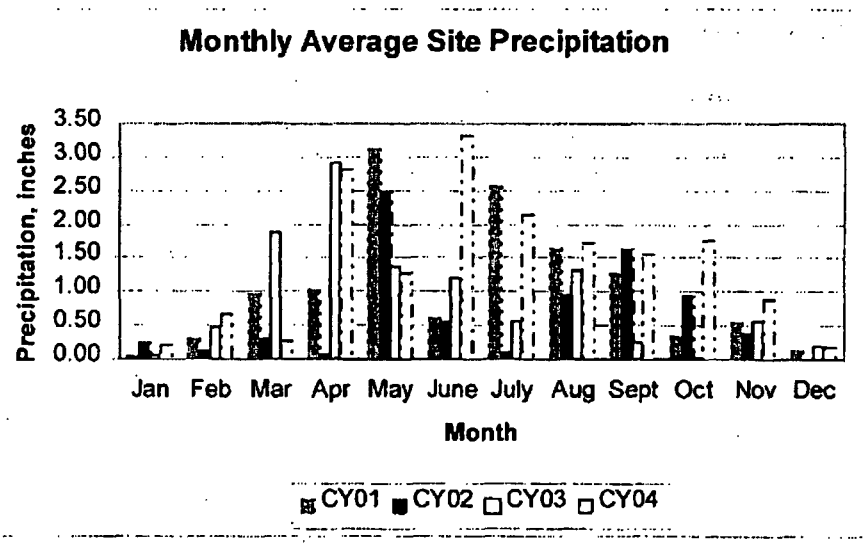

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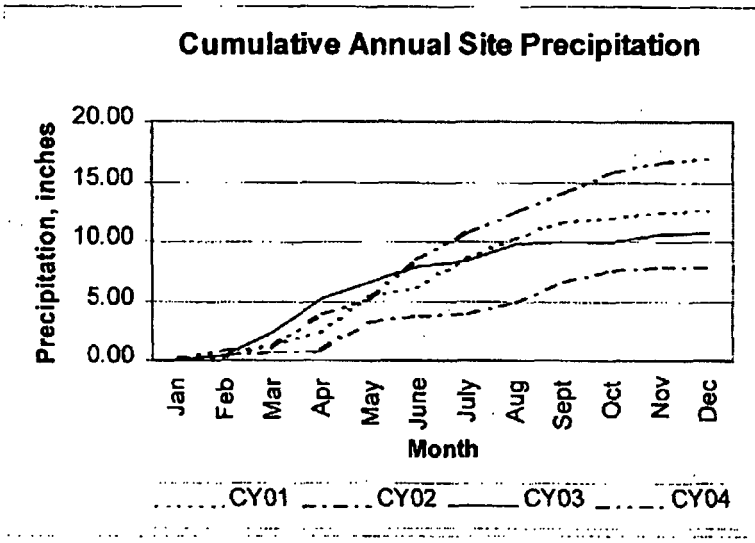
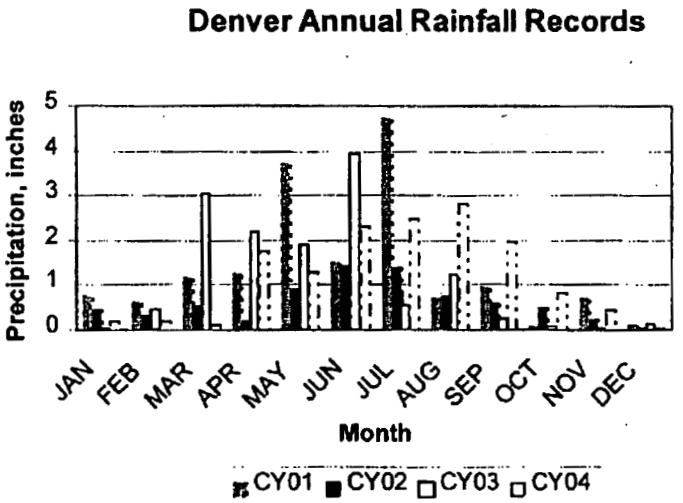
Figure 2 Cumulative Annual Precipitation at the Site



March 2003 was the snowiest March on record for the City of Denver according to official records (NOAA 2004). A powerful winter storm between March 17 – 20 dumped 31.8 inches of snow as measured at the old Stapleton Airport, the second strongest winter storm in Denver weather history (a storm in December 1913 holds the record at 45.7 inches). By the end of March, 35.2 inches of snow had fallen, the most of any March on record.

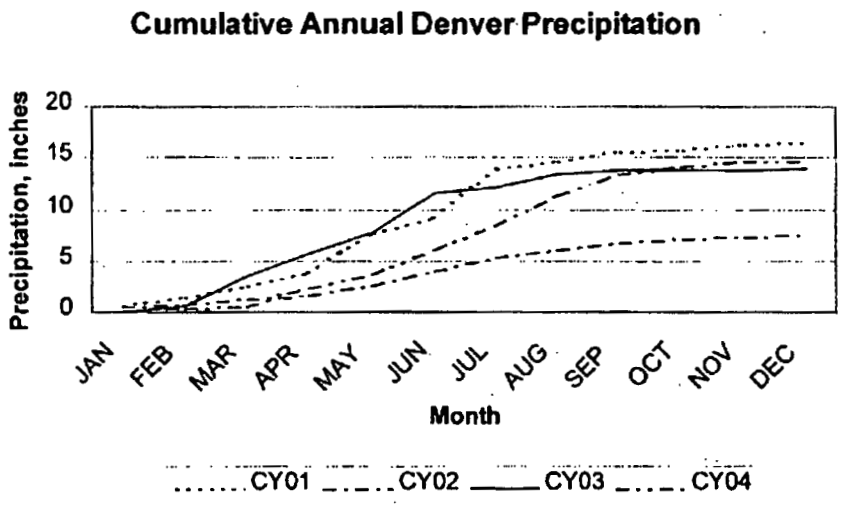
In comparison, March 2004 was much drier, with only a quarter on an inch of precipitation falling at the Site, the driest March in this study. April, however, delivered a healthy amount of precipitation, as did June (2.83 and 3.32 inches respectively), together almost as much as fell in all of CY02. While there was no major meteorological event in CY04 comparable to the Blizzard of '03, the total precipitation for the year, at least at the Site, was substantial. Denver, by comparison, only received 14.67 inches, 13% less than the Site, reversing the trend noted last year where Denver had had more precipitation in CY01 and CY03 than the Site. Such regional variation in the arid West is not unexpected.

Figure 3 Comparison of Monthly Precipitation in Denver



The cumulative annual records for Denver are similar to those at the Site, as shown in Figure 4. The pattern for CY04 is similar at the two locations, and they demonstrate the differences in precipitation that can be observed in locations as close as 16 miles apart. In general, the Site used regional hydrology for design input to storm water and other utilities. The fact that there has been measurably more precipitation in the Denver area than at the Site merely demonstrates that the margin of safety in design is greater than originally estimated.

Figure 4 Cumulative Annual Precipitation at Denver



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4.2 Flow Observations At Building 995

Daily flow readings are collected at B995 for operational and reporting purposes. The monthly Discharge Monitoring Reports, submitted to EPA and CDPHE, contain the average daily flow for each reporting period. Those data for CY04 are presented graphically in Figure 5, with a comparison to the average monthly precipitation, and are provided in tabular form in Table 1.

Figure 5 B995 Effluent Flow and Precipitation

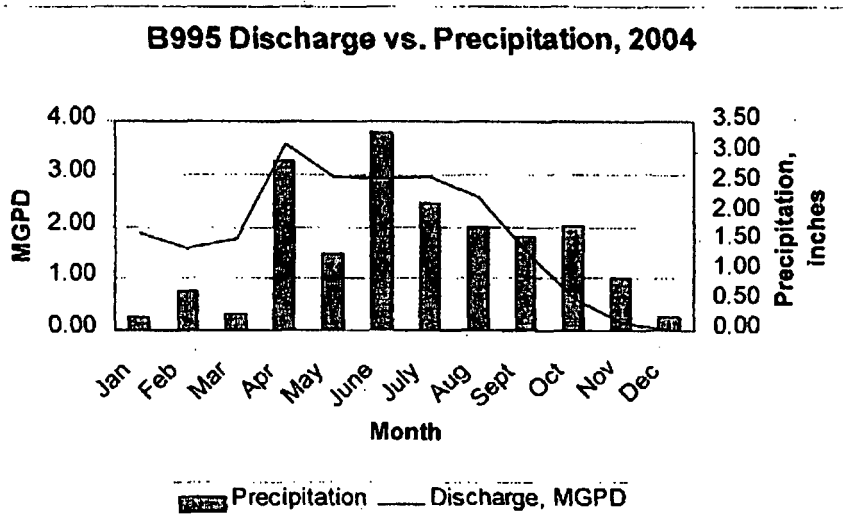

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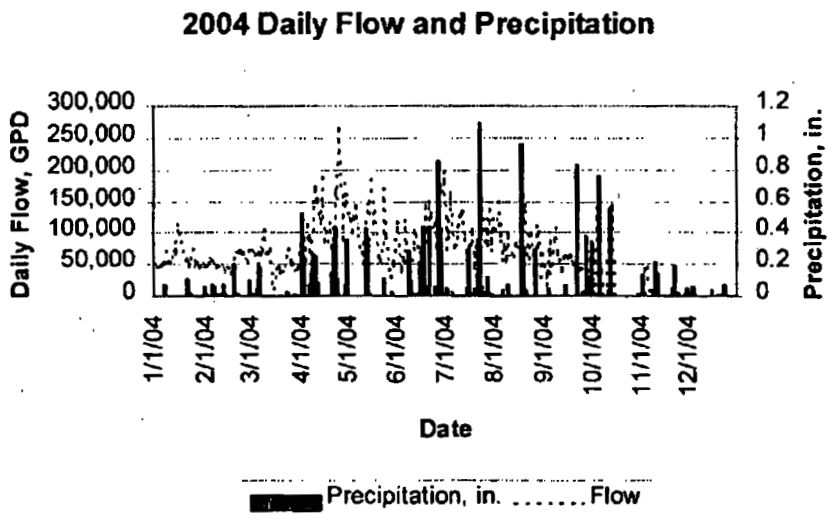
Table 1 – Summary Of Monthly B995 Flow And Precipitation for CY04

MONTH	TOTAL FLOW, MILLION GALLONS (MG)	PRECIPITATION, IN.
January	1.88	0.04
February	1.57	0.47
March	1.75	1.88
April	3.56	2.91
May	2.96	1.37
June	2.93	1.21
July	2.94	0.56
August	2.55	1.32
September	1.54	0.27
October	0.60	0.03
November	0.13	0.55
December	0.00	0.18

As in the previous reports, the daily fluctuations in discharge flow compared to daily precipitation yielded some indication as to the influence of storm events on discharge flows. For CY04, that comparison is shown in Figure 6.

Figure 6. Daily Flow at B995 and Precipitation



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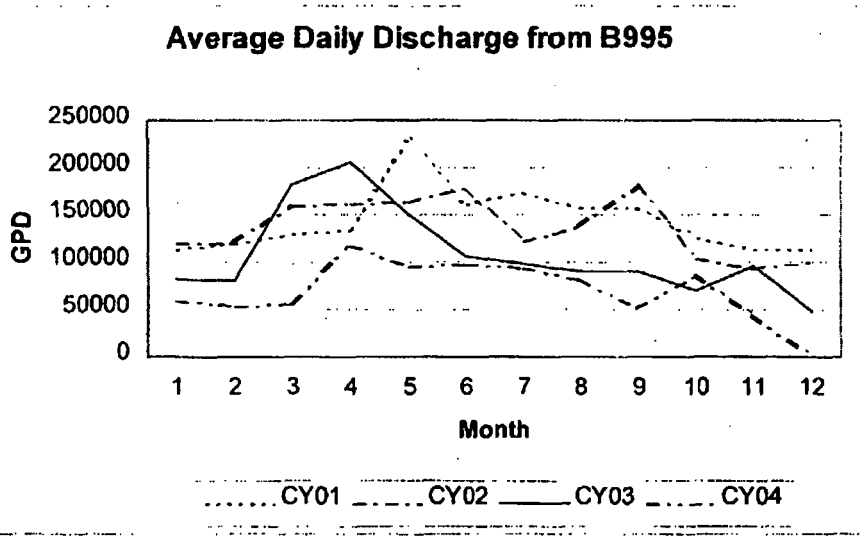
A summary of monthly flow statistics and a comparison of CY04 with CY01, CY02 and CY03 is provided in Table 2

Table 2 – Summary Statistics for Monthly Flow from B995

	CY01	CY02	CY03	CY04
Average Flow, MG/month	4.40	4.10	3.29	2.41
Std. Dev.	1.09	0.91	1.44	0.74
Minimum	3.36	2.83	1.51	1.54
Maximum	7.16	5.37	6.20	3.56

Finally, monthly CY04 effluent flows from Building 995 are compared to previous years in Figure 7. The total volume of treated effluent discharged in CY01 was about 54 MG, 49 MG in CY02, 39 MG in CY03 and 22 MG in CY04.

Figure 7 Monthly B995 Flow Comparison



4.3 Observations At Building 990

For the reasons described above, the flow monitoring at B990 was abandoned in CY04. In previous years, the flow measurements from B990 were indistinct from those measured at B995, so they added little to the estimation process for infiltration and inflow.

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5 EVALUATION

The RFETS WWTP performed well during its last days of operation in 2004. 2002 data suggest that there was little influence from I&I on plant flows, as might be expected in a year with extremely low precipitation. Where the CY01 data suggested a distinction between wetter and drier month flows at B995, the CY02 data showed less variation from month to month. Peak monthly flow in CY01 was over 7 MG compared to just over 5 MG in CY02, where both years had just over 4 MG average monthly flows. Similarly, CY03 had a distinct difference between wetter months (greater than 3 MG monthly flow) and drier months (less than 3MG flow), with a peak flow of 6.2 MG and an average of 3.3 MG, well below the previous two years.

In CY01, a comparison of monthly variation suggested a range of I&I between 20% to 40%, although the variation could have been explained by increased cooling water flows in the summer months. If the monthly averages are compared to the annual average plus one standard deviation, the peak month in CY01 had a 30% increase in flow, which coincided with the heaviest precipitation event of the year. Using the same method, the comparison of monthly flows in CY02 to the annual average plus one standard deviation showed a 6% increase in flow. For CY03, this same comparison shows a 24% increase in flow in the peak month over the average plus one standard deviation, and in CY04 the value was 13%, even though CY04 had the highest rainfall of the four years of this study.

These data suggest that I&I continued to be a factor in the sanitary collection system at Rocky Flats, and that in CY04, as in previous years, the influence of inflow is greater than that of infiltration. In fact, given the observations of good general repair in the collection system as detailed in previous reports, it is likely that infiltration at Rocky Flats contributes little to increased flows during wet weather. During the active closure of the collection system, zero flow was observed at B990 even before all of the manholes had been cemented shut, suggesting that there were no continuing sources of infiltration.

6 CONCLUSIONS

Infiltration and inflow have been assessed for a final year at the Rocky Flats WWTP. The plant operated well in CY04 suggesting that fluctuations in influent flow due to inflow did not impair the treatment processes. Using the comparative process established in previous reports, it appears that the wet weather impacts to the collection system added up to 13% of the flow volume over average conditions in CY04, and that for the period of this evaluation, the Rocky Flats sanitary collection system behaved much like most such systems with a range of 6% to 30% I&I.

7 REFERENCES

City of Boulder 2002 Drought Response Plan

DOE March 2002 Evaluation of Infiltration and Inflow at the Rocky Flats Environmental Technology Site Wastewater Treatment Plant, Building 995.

DOE April 2003 Evaluation of Infiltration and Inflow at the Rocky Flats Environmental Technology Site Wastewater Treatment Plant for Calendar Year 2002 .

DOE April 2004 Evaluation of Infiltration and Inflow at the Rocky Flats Environmental Technology Site Wastewater Treatment Plant for Calendar Year 2003

NOAA 2004 http://www.crh.noaa.gov/den/cli/climo.php

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